A New E-learning Model for IS Education: How Chinese Students Learn Business Management from Simulation Game

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***Abstract*-Now more business schools use simulation technology to develop their students' capabilities. However, there is a few framework and methodology one needs to understand the mechanisms of the student learning process in business simulation games. Based on the game and the competition we developed in China, a qualitative study was conducted with data collection and a series of in-depth interviews (or focus groups) with experts, scholars, and students. The research constructed theoretical relationships and developed a grounded theory of business skills learning and development in a competing environment. The study found that students who played the simulated business game in a competitive setting used a participatory learning model and become more professional, powerful and creative in their future professions. The learning by playing model provided an innovative approach in solving the educational and technical challenges of IS education.**

Keywords-Simulation Game, IS Education, Business Management, Key Capability

I. INTRODUCTION

With the development of Information technology, IS is popular in enterprises and IS education is also necessary in business schools. But today's IS education is at a crossroads both in the China and the United States. Pfeffer and Fong (2002) argue that business education in business schools is not successful even if business school's enrollment soars and business education becomes big business. Business simulations have become an increasingly popular teaching method in business courses (Faria 1998; Keeffe, Dyson & Edwards 1993), such as business strategies (Stephen Parente & Brown 2002), business ethics (Wolfe & Fritzsche 1998), and courses on cultural differences (Chatman & Barsade 1995). In the virtual market created by business simulations, students can better understand the interactive effects of the environment, competitors, and employees (Romme 2003). Researchers from Peking University and Silicon Valley took a new educational change initiative and built a platform called BizSim game in which students competed with each other in a virtual business environment without the boundaries of schools. We will discuss the implications of BizSim game as a complementary tool of for a routine class model and how to bridge the gap between the classroom and the world of real-life business decision making through experiential learning experiences in which students design, implement, and control business strategies and operations (Yang Xu & Yi Yang 2010).

II. LITERATURE REVIEW

General Appearance

Nowadays, Business schools are expected to provide more practical courses for their students. Due to the lack of enough external company resources, many business schools throughout the world have developed simulation courses as complements to practice and training. Students in business schools prefer learning by doing (or playing) rather than learning by teaching. Some studies have provided evidence that learning by doing (also known as experiential learning) is more effective for students to better understand business practice (Galea 2001; Mintzberg 2004). In these disciplines, there are already many experiential models to help with clinical training or learning by doing—experiential learning—where "concrete experience is the basis for observation and reflection" (Kolb 1976). For business education, Kolb (1976) also indicated that "the practice of management is best taught as a craft, rich in lessons derived from experience and oriented toward taking and responding to action." The demands for better managers and better leaders, and the demands for business knowledge are relentless, and these demands have already generated numerous alternative sources of supply (Pfeffer & Fong 2002). Figure 1 illustrates the gap between the classroom and the world of real-life business. This gap creates barriers in which students have difficulty understanding real business. Students learn the IS skill and business skill from classroom, but the real business is always different from classes. There is a gap between the theory and the practice.

Figure 1. The gap between the classroom and the world of real-life business.

III. METHOD

To provide an enterprise management learning and a platform for practice, the research team and volunteers from Peking University over a period of 20 years, developed the "BizSim Performance Management and Decision-making competition Platform". This platform creates a virtual business environment for students to exercise the decision-making process, which fosters the abilities of decision-making, organizational management and a spirit of teamwork among students.

Players make comprehensive use of various kinds of business management knowledge, using computer software to support decision-making. The decisions of each team are manipulated in a simulated environment. During a teaching

session using this platform, student teams establish virtual companies, in which students work as the general manager, production manager, marketing manager, financial manager and human resources manager respectively, to make business decisions. Each company develops a competitive strategy by themselves and uses decision-making software to determine price, sales, product positioning, promotion, research and development budgets, production levels, and financing requirements. These virtual companies compete in a simulated market environment, and the grades for each student are be evaluated in accordance to the performance of each team.

The BizSim system integrates many real business scenarios and can be used to launch a large-scale business competition like the widely recognized Olympic Games. Up till now, we have launched a serial national business competition based on the BizSim platform successfully for many years. The number of participants gradually increased from one thousand players in 2003 to nearly twenty thousand players in 20101.

Table 1 gives a simple description of these respondents. In this study, a transcript was taken of all comments made for constant comparison. The interview data was then coded and compared to form an initial theoretical relationship. Furthermore, we also clustered the most common ideas and concepts made by a majority of the respondents. The highlighted result consists of a set of the key parameters that were critical in terms of motivations, required skills and attitudes about BizSim and the China Youth Innovation Competition.

Table 1. Interviewees of the Game in the Research Process.

Participants Type	Numbers	Institutes
Players/ Teams	22/10	Universities All over in China
Volunteer	6	Universities in Beijing
Teachers	4	Peking University

The goal of an interview taken in this research process was to provide cross validation for documents derived from the blogs of players through questioning some open-ended questions, i.e., what motivated students to play the game and what they expected to achieve in the game. Before the interview we outlined our research questions and adopted consistent wording and asked each question in the same way to the participants to minimize bias. We used a consecutive list of open questions to ask players who participated in the game and as well as volunteers who organized and managed the game through providing backup support for players and maintaining the daily normal operation of game. We also asked four teachers some questions to analyse their attitudes towards the game. These questions have been given in Appendix I.

IV. RESULTS OF INTERVIEW ANALYSIS

A. Why they Like to Participate in the Game

In a pretest interview, the participants, including players and volunteers, provided various results when we asked what they want to learn in the increasingly changing era. Generally speaking, "Learning is not an explicit goal. Nowhere does Robinson address the issue of what he wants to learn" (Armstrong 1995). Furthermore, all of them were almost aware enough of the fact that high-speed technology advancements and strong competitive pressure as well as individual needs of self-fulfillment enable everyone to be a lifelong learner in this era. So then, fast learning, learning by doing and putting what they had learned into practices have widely struck a responsive chord in the hearts of current students in China. As far as what students (e.g. business students) want to learn, the undergraduates and graduates contained different trends, at least in our interviews. For undergraduates/young people, learning by playing helps them improve their hands-on capability and adapt to the changing business environment in China. For MBA students, leaning by playing helps them improve their "use of the head" capability and adjust their real business practices and do better.

After that, student motivation was collected and examined. Table 2 illustrates the frequencies of top motivations identified by all participants. Making new friends was the top motivation in both players and volunteers. As a general concept, the game provides a platform for students to cooperate with each other and establish good friendships. However, some students thought they participated in this game just for fun. Finally, there were some students who believed that playing this game could help them gain managerial experience and enrich their lives in their spare time, outside of work.

Table 2. Frequencies of Top Learning Motivations Identified by All Participants.

Top learning motivation	Total references	Players	Volunteers
Make more new friends	20	15	5
Just for fun	16	13	3
Gain managerial experience	14	11	3
Enrich spare time life	10	8	2
Self-fulfilment	6	5	1

The volunteers especially thought that serving the players was valuable for gaining learning opportunities. Most of the volunteers had good feelings that the organization of the game would expand their vision and they would come into contact with a widespread number of different students. Some volunteers wanted to undertake the responsibility for service to realize their self-fulfilment. We also examined whether there existed a significant difference between the volunteer and players. When we asked what was the biggest difference of the two distinct roles as volunteers and players, a few volunteers replied that organizing and managing the game provided more practical and more challenging experience than playing the game as a direct participant. One explained: "Look, I am serving the game which has more than twenty thousand players. It's no wonder that the achievement of playing and experiences I've gained would not gained when directly playing the game as a competitor." Considering the biggest difference of the two roles, another volunteer explained that "volunteers paid more attention to organizing and managing the 'real' playing processes of this game and players focused more on how to win the 'virtual' game".

[1] http://www.bigsai.net/

B. What They Learned from Participation in This Game

The open-ended questions on the interview survey were reiterated by the interviewees to answer what they learned from participation in the game. These results confirmed what we received from their blogs. We also asked some teachers about their teaching objectives using simulation games, the results which also agreed with our interview results from the students. The identified themes on their outcomes, to an extent, included their participating motivations as well as business educators' expected objectives. What they learned from playing the game mainly included six important outcomes: putting theories into practice, creating new ideas and fun in business practices, gaining more business experiences and enhancing business capabilities, discovering more opportunities and advantages than other students among their peers, strengthening self-confidence, and making excellent friends (including teachers and peers). Table 3 gives a simple description of frequencies of the top learning outcomes identified by all participants (players, volunteers and teachers).

For game players, 60% of them suggested that the game could help them put what they had learned from classes or textbook into their actual life. There is no doubt that more knowledge and skills are needed to run a real company. However, playing the game helped them positively use their heads to solve lots of practical problems. The competition of this game forced them to develop their creativity in order that they do better than their counterparts. 50% of the players thought that the game provided more motivations to drive them in creating new ideas and creatively coming up with ingenious tactics different from other teams. 45% of the players believed that the practical exercise of running the game helped gain more business experience and improved their business capabilities and skills, learning about good and systematic understanding in business operations. Some players (30%) appreciated the opportunities to intern and train in famous international and state-owned enterprises and the appreciated the advantages of distinguishing themselves to be easily identified by job hunters.

Students also "liked the chance to get to know and work with other students" and they believed that the game "created good friendships that normally wouldn't have been". One player revealed that the game allowed their team into reciprocal peer tutoring, helping him in other classes. Another student pointed out that "I liked the atmospheres in which I had a group to sit with, go to if I needed help, and to be a part of." Also, 15% of the students enjoyed the comfort of playing with peers and they performed with more self-confidence than before. Some positive comments were, "I don't worry any more whether I can deal with certain challenges and difficulties, ever since I played an important role in the intensive competitive game." "Always making decisions by ourselves and knowing it was not the end even if I lost," "I loved the comfort and confidence of knowing that I had people available to help and had to be responsible for them," and " as an indispensable member, I must believe in myself for the benefit of the whole team, especially when they need me."

Most of the outcomes identified by players were also verified by the interview results of the volunteers and teachers. As column four and five in Table 3 state, putting theories into practice, gaining more business experiences or capabilities and more opportunities or advantages are listed or mentioned by volunteers and teachers. For some volunteers, they recognized that the training game forced them to try to innovate and they were delighted in playing it. Another volunteer said that he became more self-confident through serving the players and coping with the difficulties in the game simulation process. At the same time, two teachers also explicitly implied that the innovative teaching model really facilitated student creation and innovation and aroused their curiosity of the students so much so that the competitive rule of the game might stimulate students to in further efforts for greater achievements. One volunteer said when he talked about the players' performances, "if you provide a suitable stage they will give a perfect performance; let them do it by themselves and their accomplishments could go beyond what you expected."

Table 3. Frequencies of Top Learning Outcomes Identified by All Participants.

Top learning outcomes	Total references	Players	Volunteers	Teachers
Put theories into practice	20	13	4	3
Provide new idea or fun for business practice	17	12	3	2
Gain more business capability improvement	17	10	4	3
More opportunities and advantage than other students	15	10	2	3
Make excellent friends	12	10	2	0
Self-confidence enhancement	6	5	1	0

When having been asked about their feelings, all of the students gave a positive comments on the game. After playing this game, one student responded that "regardless of how difficult a project, as long as it is valuable we would follow our way without hesitation, and just as a proverb said, 'If you don't go to the tiger's den, you gain nothing'. Those who own the courage to struggle against challenges will be likely to find joy and happiness. When we do feel that we are about to arrive at the peak, actually we have a new feeling that we have only reached the foot of a hill."

C. Students Gained Skills When Playing the Game (more interview proofs)-Skills Which Playing the Game Provided to Support their Profession Development

Further interviews were collected to explore what capabilities and skills students acquired from participating in such a game. For most of the participants, they also announced that they could acquire some skills and enhancement of their capabilities regardless of which role they played in this game. We summed up every interviewee opinion on their skill acquisition in the game, and developed categories, made comparisons and derived more than seven different skills or capabilities. Table 4 illustrates the frequencies of top skill acquired from the game. These skills are categorized into hard and soft skills. Specifically, in this game soft skills training are more emphasized than traditional textbook teaching. Thus, based on the learning process of the students we further classified the soft skills into two subclasses: social managerial skills and intuition skills. The hard skills are composed of

more business knowledge and technical skills such as finance, marketing, strategies, operation research, and computer operational skills, and so on. Social skills include communication, team building and collaboration, public relationship ability and management and decision-making skills (i.e. planning, organizing, coordinating, stimulating, and decision-making). Intuitive soft skills, which usually are rooted in people's talent and wisdom, consist of learning skill, innovation skill and leadership skill.

Table 4. Frequencies of Top Skill Acquired / Required From the Game.

Top skill acquired	Total references	Players	Volunteers	Teachers
Social communication skill	22	14	5	3
Learning skill	18	10	2	2
Team building skill	17	10	4	3
Decision-making skill	16	10	4	2
Technical skills	15	11	2	2
Innovative skill	8	2	3	3
Leadership skill	5	2	1	2
Public relationship ability	4	1	3	0

V. DISCUSSIONS

According to the interview results and grounded analyse we conducted, we derived that this kind of new e-learning model helps students acquire various business skills, most of which could not be gained from traditional classrooms. There is no doubt that acquiring these business skills must depend on a designed learning process. This model provides a designed learning avenue to train and develop particular skills that will play an important role in students' future careers. Based on the grounded research we found that the designed learning process is necessary to support acquired skill enhancement. For training future business leaders, business schools now have to provide better designed curriculum towards business practices. We may also remember Mintzberg's (2004) philosophy that "good management education will help people 'learn to ask the right questions, to reflect, and to avoid the traditional manager's trap of reacting to one crisis after another'." As a matter of fact, both technical and analytical techniques (easily imitated), as well as not so easily imitated "soft" skills (i.e. communication skills or leadership) are equally as important for students' success in future business. Therefore, the two should be designed in the curriculum and taught in business schools. (Pfeffer & Fong 2002)

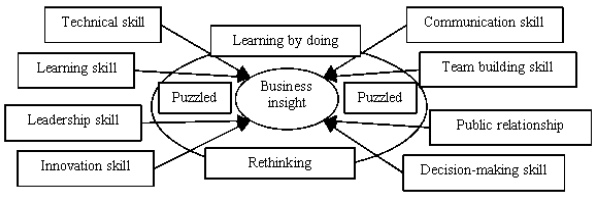

Figure 2.Aligning business skills with learning cycle breeding them.

A. Learning Cycles that Affects skill Acquisition

As Mintzberg's (2004) proposition stated, learning is coupled with the application of that learning, sometimes in groups, and invariably in ways relevant to the individual's current conditions, such as his existing learning ability, job and company. That is, learning always involve in doing. Our learning by playing philosophy indeed is a type of learning by doing. Therefore, learning, doing, rethinking, and learning again finally form a continuous learning cycle. We describe this learning cycle with a simple process: Firstly, when students begin to play the game they prepare for learning with some necessary technical and managerial knowledge and skill. During the actual game, they use their learned knowledge to manage their businesses and also learn by doing through team building, communication, decision-making and public relationship management. They might often feel puzzled when they have to make a choice to do right things, which results in their re-analysis, just as Confucius said, "Learning without thinking leads to confusion, thinking without learning ends in danger." Through in-depth rethinking students tap their potential and train individual leadership and creativity as well as practice the ability to learn quickly, after which they may possibly be thrown into confusion again. At this time they have to quickly learn useful knowledge by repeating the process, and, thus the learning cycle naturally comes into being.

B. Skills Acquired Through Learning Cycles

With the learning cycle repeating endlessly, students gain various skills or enhancements of their capabilities through their actions. From our grounded research, Figure 2 has provided a theory on students learning using the BizSim game as a basis, which is aligned with some business skills that have been identified from all the participants of the game; the game intrinsically uses a designed learning cycle which breeds these skills. In the learning cycle, technical skill or managerial knowledge as well as social skills are firstly realized. That is why most of interviewees believed that they really acquired these tangible results by participating in the game. Only a few students emphasized they gained an improvement in their intuitive business skills during the processes. However, there are many kinds of business skills which can be gained through learning cycles that finally would at least have bearing on a student's future business insight. In fact, almost any implicit skill or business insight might not be perceived immediately, but that skill may have a long and latent period in which to develop. Through continuous learning by doing, students would eventually make sense those attributes and would eventually understand as important in business and which attributes they thought were enhanced by the practical curricula in the business school. Meanwhile, students also would recognize which skills are important and what they might perceive business schools as proficient in developing. Thus, they might choose their own ways to learn and what curricula they believed is important for their career development.

C. The Four Cycles model makes up the gap between the classroom and the world of real-life business

This research is an exploratory study based on BizSim participants, including players, volunteers, organizers and even

organizers using players' comments in their blogs on the BigSai Website, a series of focus groups and in-depth interviews. The study found that the effectiveness of the learning by playing model has been based upon the fulfillment of overcoming the four gaps by a cooperative mechanism.

Figure 3 illustrates the 4 cycles cover for the 4 gaps in business education when schools introduced a practice-oriented game platform for students.

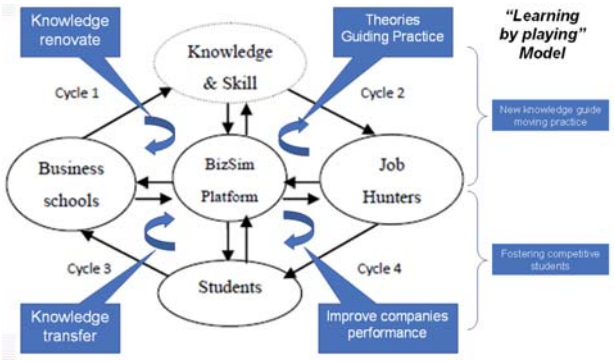

Figure 3.The gaps of current business education based on BizSim platform.

Cycle 1: Using this platform can help students put theories from classrooms into their "real" business running practices. The game provides an approximate real business world to guide students to use their learned theories and techniques. 80% of the game players suggested that the game could help them put what they had learned from classes or textbooks into their actual playing of real business scenarios. This changes the old paradigm that business schools must improve curriculum and add new knowledge which enterprises need immediately and insert "soft" skills into the curriculum.

Cycle 2: This platform provides more opportunities for job hunters to find suitable people they want to employ. Under these circumstances, we tried using the BizSim game to identify different kinds of talented students (e.g. winners of the game), and then recommend them for competent posts to job hunters. Naturally, when job hunters give feedback with their real needs and the new changes from the market and enterprise environment, this encourages business schools to change their paradigms. Therefore, talented students who are engaged by managers can use their knowledge and skill to help enterprises improve their old business models. An economics professor (also a leader of the business school) recognized that leadership development in this game has great potential. He said, with strong conviction: "This competitive game can really help cultivate the best business management team in China. If there exist world-class enterprises and business leaders in China from some of the players and not just for those winners, they may partly remember and tag this game when they talk about their reasons of business success. At that time, it would naturally provide proof that the projects have textbook by playing simulation games. Learning by doing helps students upgrade their business skills, gain social recognition, enhance their competence in the job market, and finally solve their worries about future education. Thus, students may realize Confucius's proposition that thinking follows learning and learning merges with action. The platform had an important effect and made a great contribution to the management of Chinese business, the enterprises of China, and the economy of China."

Cycle 3: The learning by playing method encourages students to aspire after business knowledge and insight. This is also a very important cycle. In traditional teaching, most students have become tired of absorbing knowledge partly because they think that what their school has taught is separate from actual business practice. The "spoon-fed" teaching methods should be changed. Students also "liked the chance to get to know and work with other students in playing" and the "learn by playing" model aroused their enthusiasm to gain knowledge. A vast majority of the students showed great interest and excitement in playing the game no matter whether their roles were as player or a volunteers. This new "learning by playing" teaching method can improve the old business school teaching model.

Cycle 4: This platform helps job hunters change their "hunting" model. Under approximate real business circumstances, job hunters would know the students' abilities well, especially as they are under great pressure. Just as some students said, "we would follow our way without hesitation, and just as a proverb said, 'If you don't go to the tiger's den, you gain nothing'." Actually, "if you provide a suitable stage they will give a perfect performance; but let them do it by themselves and their accomplishments could go beyond what you expected," one volunteer said.

In addition, these new teaching and learning methods have some advantages. One is to make use of information technology so as to provide a comprehensive perspective of business operations, as business schools strive to provide students with a rewarding and effective educational experience. A computer-simulated enterprise management environment used as a complementary teaching tool can help can assist the stream of business education. The most important aspect is to "learn by playing" , which can encourage excitement and enthusiasm among students and foster curiosity so as to gain knowledge and business skills. Students can play these simulation games to learn knowledge and by winning the game (while gaining skills) find better jobs. This cooperation mechanism helps students to accumulate capabilities in a more efficient way, helps business schools provide better services and attracts more students, while supporting enterprises to employ suitable employees.

VI. CONCLUSIONS

Our study has demonstrated that simulation games can improve the plight of current business education and as well as providing students a way to learn how they like, for the careers they hope to someday obtain. From this study we have made the following discovery: students can learn more than the

we designed can substantially reduce the transaction costs of recruiting and training.

In the future, the learning by playing model can be used to guide the development of serious games and promote the capabilities of teaching skill and knowledge.

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